Space Weather Forecast

Issued on Sunday, 09 June 2024 at 12:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate (S1) solar radiation storm at first on day 1 (09 June), gradually reducing. Moderate geomagnetic storm (G2) likely on day 2 (10 June). Minor/Moderate (R1/R2) radio blackouts likely, risk easing into new UTC week.
Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate during the last 24 hours, with a couple of weak Moderate-class flares. No new CMEs were noted in the period.

There are currently up to eleven sunspot regions on the Earth-facing side of the Sun. The most active region on the disc remains a large and complex group in the southwest, with this group showing signs of decline as it approaches the west limb. Other regions are smaller, magnetically simpler and either showing slight decay or little change in development.

Solar Wind / Geomagnetic Activity: Solar winds showed some coronal hole influence being predominantly slightly elevated, with occasional peaks into elevated levels, towards the end of the period it eased towards background levels. The number of particles below average. The magnetic field trace was weak as was the north-south component.

The net result of the above solar wind measures was for Quiet (Kp 1 to 2) levels with one Unsettled interval early in the period.

Energetic Particles / Solar Radiation: Solar radiation levels have eased back to Minor (S1) solar radiation levels. 100MeV protons also showed a slow downward trend.

Four-Day Space Weather Forecast Summary

Solar Activity: Further Moderate-class flares are Likely, with an ongoing slight chance of Strong-class flares - these most probably from the sunspot regions in the far southeast and far southwest. The probabilities of both fall slightly by the very end of the four days as a result of the passing from the Earth-facing side of the westernmost of these groups.

Solar Wind / Geomagnetic Activity: The CME associated with the 08/0149UTC Moderate-class flare shows an 'asymmetric halo' in its shock, and there is considered a risk of G2 moderate geomagnetic storm conditions on Monday 10 June. This is the only CME currently in the forecast.

Background to Slightly elevated solar winds are expected on day 1 (09 June). On day 2 (10 June) solar winds are likely to become elevated, perhaps strong, with the anticipated 08 June CME arrival. Winds will then gradually subside through days 3 and 4 (11 and 12 June).

Geomagnetic activity is expected to be Quiet to Unsettled on day 1 (09 June). The arrival of 08 June CME is expected during the UTC morning of day 2 (10 June), with G2/Moderate geomagnetic storm conditions likely to develop for a time. Elevated geomagnetic activity may

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linger into the start of day 3 (11 June), before gradually waning to mainly Quiet by the end of the four-day period.

Energetic Particles / Solar Radiation: High energy proton flux will continue to show a very gradual waning tendency following its S3 Strong solar radiation storm peak, although proximity to this level means that any further suitable events from the western sunspot group may see levels rise once again. Minor solar radiation S1 is therefore expected at first, with a slight chance of S2, falling to an expected background levels into day 2 (10 June).

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	70	30	1
Strong	G3	No	1	10	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	60	60
Very Active	R3 to R5 X	No	15	15	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	100	40	20	10
Very Active	≥ S3 *	No	5	5	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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